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EXAMINER

SWEARINGEN, JEFFREY R

ART UNIT	PAPER NUMBER
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2145

MAIL DATE	DELIVERY MODE
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10/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/633,104

Applicant(s)

EMMOT, DAREL

Examiner

Jeffrey R. Swearingen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This case has been assigned to a new Examiner.

Response to Arguments

2. Applicant's arguments filed 7/23/07 have been fully considered but they are not persuasive.
3. Applicant argued that Dittia failed to disclose the use of priority data in determining which path the data should be routed over, or the use of demand information in determining which part the data should be routed over. Applicant apparently misread the citations in the previous rejection. Column 6, lines 8-19, clearly show the use of indicators for each type of service for each destination, which is the obtained priority information.
4. Applicant argued that Dittia failed to disclose routing the information based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of channels. Applicant should read column 9, line 61 through column 10, line 2, in light of column 6, lines 8-19 to find the priority and demand information.
5. In regard to the Perlman reference, Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Assuming *arguendo* the argument did comply, Perlman still taught the use of distance vectors – a communication length.
6. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Perlman was a reference used to illustrate the commonly known distance vector routing algorithm, which is well known to one of ordinary skill in the art. The previously cited motivation was to promote the most efficient routing path based on Perlman,

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column 5, lines 42-45. Further motivation can be found in one of ordinary skill's natural desire to save bandwidth and network resources, which is accomplished by the use of distance vector routing protocols.

See *KSR v. Teleflex*.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 7-9, 12, 17-18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittia et al. (US 6,826,186) in view of Perlman et al. (US 5,243,592).

9. Regarding claims 1 and 17, Dittia et al. discloses in a multi-node network comprising a plurality of distributed switching nodes (column 1, line 67-column 2, line 7, with the interconnection elements seen as switching nodes for selecting a path), a method implemented in at least one of the plurality of nodes for muting information entering the node over a first channel to one of a plurality of other channels, or out of the node over a first channel from one of a plurality of other channels (column 2, lines 27-31, with routing over multiple paths is seen as routing in a node from a first channel to one of a plurality of other channels or from a plurality of other channels to a first channel and Figure 3B, with multiple paths entering a node and multiple paths leaving a node, and the system is responsible for routing to and from these paths), the method comprising: obtaining priority information for the information (column 6, lines 8-19, with the distribution of information routing is determined on service type, which can comprise a service priority, seen as obtaining a priority from the information to be routed); determining a current demand for each of the plurality of other channels (column 9, line 61-column 10, line 2, where each destination has a specific output buffer, and the buffer length is used in routing determination, seen as determining a current demand for the output channel); and routing the information entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority

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information, and the current demand for each of the plurality of other channels (column 9, line 61-column 10, line 7, with the device placing certain priority data into a specific output buffer, and the buffer lengths are also used to determine routing destinations, seen as using a combination of current demand for the channel and priority information to determine routing destinations).

10. Dittia et al. does not disclose ascertaining a remaining communication length for the information for each of the plurality of other channels and then using that information is combination with the other information to determine routing. The general concept of determining path length and using that to determine routing is well known in the art as illustrated by Perlman et al. Perlman et al. describes a system that uses distance vectors to provide routers with information regarding communication lengths, and then routing information using this distance determination (column 5, line 55-column 6, line 1, with the routers determining communication lengths for distances from source and destination and then using that information to route information on the most efficient path).

11. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. with using communication length determination and then using that factor to assist with routing the information as taught by Perlman et al. in order to incorporate the commonly used distance vector routing algorithm as to make the most efficient routing path determination as noted in Perlman et al.'s disclosure in column 5, lines 42-45.

12. Regarding claims 2 and 18, Dittia et al. and Perlman et al. teach all of the limitations as described above, with Dittia et al. further teaching the method of claim 1 or claim 17 further comprising determining a demand for channels coupled to remote nodes between a current node and a destination node and utilizing this information in determining a channel over which to route the information (column 9, line 61-column 10, line 7, with the device placing certain output data into a specific output buffer, and the buffer lengths are also used to determine routing destinations, seen as using current demand for the channel from the current node to remote nodes to determine routing output channels).

13. Regarding claim 3, Dittia et al. and Perlman et al. teach all of the limitations as described above, with Dittia et al. further teaching the method of claim 1 further comprising obtaining a destination node from a header portion of the information (column 8, lines 15-20, with routing path information being

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included in the header portion of the data, and then used to determine the route, seen as including a next destination node in a header portion of the information).

14. Regarding claim 4, Dittia et al. and Perlman et al. teach all of the limitations as described above, however Dittia et al. does not disclose ascertaining a quantifiable identification of a number of intermediate nodes that the information will traverse before reaching its destination as part of the ascertaining remaining communication length step. The general concept of determining a number of intermediate nodes before a destination node and then use this information for routing purposes is well known in the art as illustrated by Perlman et al. Perlman et al. describes a system that uses distance vectors to provide routers with information regarding communication lengths, and then routing information using this distance determination (column 5, line 55-column 6, line 1, with the routers determining communication lengths for distances from source and destination and then using that information to route information on the most efficient path). Perlman et al. describes a distance vector and shows that it includes the number of intermediate nodes before a destination node (Figure 2a). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. with using communication length determination with quantifiable numbers of intermediate nodes and then using that factor to assist with routing the information as taught by Perlman et al. in order to incorporate the commonly used distance vector routing algorithm as to make the most efficient routing path determination as noted in Perlman et al.'s disclosure in column 5, lines 42-45.

15. Regarding claim 7, Dittia et al. and Perlman et al. teach all of the limitations as described above, however Dittia et al. does not disclose receiving and evaluating information from other nodes on the network as part of the ascertaining remaining communication length step. The general concept of receiving information from other nodes on the network and then using this information for routing purposes is well known in the art as illustrated by Perlman et al. Perlman et al. describes a system that uses distance vectors to provide routers with information regarding communication lengths, and then routing information using this distance determination (column 5, line 55- column 6, line 1, with the routers determining communication lengths for distances from source and destination and then using that information to route information on the most efficient path). Perlman et al. describes a distance vector is

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sent around the network nodes to build the network's neighbor list (column 5, lines 55-59, with the distance vector being passed around from node to node to build the neighbor list in order to more efficiently route). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. with receiving information passed from other nodes to assist with routing the information as taught by Perlman et al. in order to incorporate the commonly used distance vector routing algorithm as to make the most efficient routing path determination as noted in Perlman et al.'s disclosure in column 5, lines 42-45.

Regarding claim 8, Dittia et al. and Perlman et al. teach all of the limitations as described above, however Dittia et al. does not disclose ascertaining the remaining communication length based on a priori information. The general concept of evaluating a priori knowledge to determine communication lengths is well known in the art as illustrated by Perlman et al. Perlman et al. describes a system that uses distance vectors to provide routers with information regarding communication lengths, and then routing information using this distance determination (column 5, line 55-column 6, line 1, with the routers determining communication lengths for distances from source and destination and then using that information to route information on the most efficient path). Perlman et al. describes a distance vector is sent around the network nodes to build the network's neighbor list (column 5, lines 55-59, with the distance vector being passed around from node to node to build the neighbor list in order to more efficiently route). Each router has no knowledge of the nodes passed the immediate neighboring nodes until a distance vector is passed to it (column 5, lines 49-55). This is seen as using a priori knowledge to determine communication lengths since a router receives knowledge of the network topology upon receipt of the distance vectors and this information comprises communication lengths. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. with receiving a priori knowledge passed from other nodes to assist with routing the information as taught by Perlman et al. in order to incorporate the commonly used distance vector routing algorithm as to make the most efficient routing path determination as noted in Perlman et al.'s disclosure in column 5, lines 42-45.

16. Regarding claim 9, Dittia et al. and Perlman et al. teach all of the limitations as described above, with Dittia et al. further teaching the method of claim 1 wherein the determining the current demand for

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each of the plurality of other channels comprises evaluating a state of an output queue for each of the other channels (column 9, line 61- column 10, line 7, with the device placing certain output data into a specific output buffer, and the buffer lengths are also used to determine routing destinations, seen as using current demand for the channel based on the output queue state for determining the demand for each of the other channels).

17. Regarding claim 12, Dittia et al. and Perlman et al. teach all of the limitations as described above, with Dittia et al. further teaching the method of claim 1, wherein the information is embodied in a packet (column 2, lines 28-31, where the system is used for routing packets).

18. Regarding claim 21, Dittia et al. discloses a node for routing information entering the node over a first channel to one of a plurality of other channels in a multi-node network (column 2, lines 27-31, with routing over multiple paths is seen as routing in a node from a first channel to one of a plurality of other channels) comprising a plurality of distributed switching nodes (column 1, line 67-column 2, line 7, with the interconnection elements seen as switching nodes for selecting a path), the node comprising: logic configured to obtain priority information for the information (column 6, lines 8-19, with the distribution of information routing is determined on service type, which can comprise a service priority, seen as obtaining a priority from the information to be routed); logic configured to determine a current demand for each of the plurality of other channels (column 9, line 61-column 10, line 2, where each destination has a specific output buffer, and the buffer length is used in routing determination, seen as determining a current demand for the output channel); and logic configured to route the information entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority information, and the current demand for each of the plurality of other channels (column 9, line 61-column 10, line 7, with the device placing certain priority data into a specific output buffer, and the buffer lengths are also used to determine routing destinations, seen as using a combination of current demand for the channel and priority information to determine routing destinations).

19. Dittia et al. does not disclose logic configured to ascertain a remaining communication length for the information for each of the plurality of other channels and then using that information is combination with the other information to determine routing. The general concept of determining path length and using

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that to determine routing is well known in the art as illustrated by Perlman et al. Perlman et al. describes a system that uses distance vectors to provide routers with information regarding communication lengths, and then routing information using this distance determination (column 5, line 55- column 6, line 1, with the routers determining communication lengths for distances from source and destination and then using that information to route information on the most efficient path).

20. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. with using communication length determination and then using that factor to assist with routing the information as taught by Pedman et al. in order to incorporate the commonly used distance vector routing algorithm as to make the most efficient routing path determination as noted in Perlman et al.'s disclosure in column 5, lines 42-45.

21. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dittia et al. (US 6,826,186) in view of Perlman et al. (US 5,243,592) as applied to claim 1 above, and further in view of Gross et al. (US 6,765,905).

22. Regarding claim 5, Dittia et al. and Perlman et al. teach all of the limitations as described above except for retrieving priority information from the header portion of the information. The general concept of retrieving priority information from a header portion of information to determine routing priority is well known in the art as illustrated by Gross et al. Gross et al. describes a routing system where the routes are determined based on priority retrieved from the header portion (column 1, lines 28-32 and lines 42- 44, where each queue is setup based on priority information retrieved from the header). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. and Perlman et al. with retrieving priority information from the header of information as taught by Gross et al. in order to create less routing delay in priority packets, thus increasing the quality of service as noted in Gross et al.'s disclosure in column 1, lines 45-52.

23. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dittia et al. (US 6,826,186) in view of Perlman et al. (US 5,243,592) as applied to claim 1 above, and further in view of Knappe (US 6,922,396).

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24. Regarding claim 6, Dittia et al. and Perlman et al. teach all of the limitations as described above except for retrieving priority information by evaluating the payload portion of the information. The general concept of evaluating priority information by examining the payload portion of information is well known in the art as illustrated by Knappe. Knappe describes a routing system where congestion control is optimized and priority packets are determined by examining the type of information represented by data in the packet (column 9, lines 1-5, where priority depends on the type of data in the data portion of the packet, seen as the payload portion). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. and Perlman et al. with retrieving priority information from the payload portion as taught by Knappe in order to improve congestion control for certain types of data streams, such as voice, as noted in Knappe's disclosure in column 2, lines 34-40.

25. Claims 10-11, 19-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittia et al. (US 6,826,186) in view of Perlman et al. (US 5,243,592) as applied to claims 1, 17, and 21 above, and further in view of Raciborski et al. (US 6,658,000).

26. Regarding claims 10-11, 19-20, and 22, Dittia et al. and Perlman et al. teach all of the limitations as described above except for using a balanced weighting of the routing factors of priority, length, and demand as required by claims 10, 19, and 22, or using an unbalanced weighting of the routing factors of priority, length, and demand as required by claims 11 and 20. The general concept of using a balanced or an unbalanced weighting of routing factors is well known in the art as illustrated by Raciborski et al. Raciborski et al. describes a system where the routing of content over multiple data paths is determined by a multitude of network diagnostics (column 1, lines 50-52 and column 20, lines 35-40, where routing is performed from a client to a server, seen as a source and a destination, over a plurality of paths using a list of factors). Raciborski et al. teaches that these factors used in determining the route can be balanced equally together or unbalanced together (column 22, lines 52-59 and column 23; lines 14-18, where the methodologies to determine routing are weighted differently to alter the result returned). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. and Perlman et al. with using an unbalanced or balanced weighting of routing factors to determine the route from a

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source to a destination as taught by Raciborski et al. in order to stream large content objects of data by determining optimal routing paths as noted in Raciborski et al.'s disclosure in column 1, lines 29-31.

27. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittia et al. (US 6,826,186) in view of Perlman et al. (US 5,243,592) as applied to claim 1 above, and further in view of "Wormhole Routing Techniques for Directly Connected Multicomputer Systems" (Mohapatra).

Regarding claims 13-16, Dittia et al. and Perlman et al. teach all of the limitations as described above except for routing information when the information is embodied in a flit as required by claim 13, a plurality of flits which collectively comprise a information packet as required by claim 14, where the routing is performed on a per- flit basis as required by claim 15, or where the routing is performed on a first flit, and the remaining flits in a packet follow the same channel selected as required by claim 16. The general concept of routing flits in this way is well known in the art as illustrated by Mohapatra. Mohapatra describes wormhole routing. Wormhole routing is performed on networks using flits, which comprise an entire packet (page 380, first column, lines 24- 27). The first flit received contains the header information so it is routed first, and the other flits follow the header flit over the same path (page 380, first column, lines 28-36, where the header flit is routed using the router information, and the others are routed in the same path, seen as routing on a per-flit basis and having the remaining flits follow in the same channel as the first flit). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dittia et al. and Perlman et al. with using flit routing and wormhole routing techniques as taught by Mohapatra in order to create a more efficient data flow by using the pipelined technique as noted in Mohapatra's disclosure on page 380, second column, lines 11-18.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Anerousis et al.

US 6,760,775 B1

Lin et al.

US 2003/0065811 A1

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. Swearingen whose telephone number is (571) 272-3921. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on 571-272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason Cardone
Supervisory Patent Examiner
Art Unit 2145

JRS